

Co-visualization: Rapid Visual Access to Diverse Datasets

Graham Brew, Paul White, and Richard Schnell
Dynamic Graphics Inc., Alameda, CA
graham@dgi.com

Access to rapidly proliferating datasets is a key component of most hydrocarbon exploration and exploitation. Technical advances and increasing computing power continue to yield massive growth in data availability and diversity. Quick and easy visualization and interrogation of these data are critical for safe, efficient, and fully informed operations. We present a method for the "co-visualization" of disparate subsurface datasets of virtually any size. The fundamental core of the co-visualization scheme is a 3-D geo-referenced environment containing a solid earth model. This model should be the most accurate representation of the subsurface possible within the limits of available subsurface data. The co-visualization concept extends upon this model and incorporates all relevant spatially coincident datasets. This could include: seismic data (of various vintages), cellular models, well logs, driller's notes, production and injection history, pressure regimes, completion depths, reservoir simulation output at various time points, 2-D mapping results, cultural data, remote sensing, potential fields, etc. The interface within which the earth model resides allows instant access and interrogation of the available data. Visualization is either through tools built into the interface or by calling upon other proprietary software to display data in their native formats. A typical example would be the rapid interrogation of production data from a specific well set: by simple clicking on the well location these data could either be graphed within the 3-D model window or could call a proprietary spreadsheet application where the data reside. The production data could then be quickly compared to reservoir simulation predictions, crossplotted against injection histories, or combined in numerous ways with other data. When all relevant data can be display graphically in an easily accessible manner, interrogation becomes simpler and associations between the various data become more apparent. As levels of data collection continue to rise, these co-visualization methods become increasingly imperative.